

FOSTERING SUSTAINABLE FEEDSTOCK PRODUCTION FOR ADVANCED BIOFUELS ON UNDERUTILISED LAND IN EUROPE

D 5.1

REPORT ON THE ASSESSMENT OF THE HUMAN AND INSTITUTIONAL CAPACITY IN PLACE IN THE CASE STUDY SITES

FAO



Food and Agriculture
Organization of the
United Nations



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 691846.

Project No.	691846
Project acronym	FORBIO
H2020 Call topic	LCE-14-2014 - Market uptake of existing and emerging sustainable bioenergy
Start date of the project	01.01.2016
Duration	36 months
Deliverable ID	D5.1 Report on the assessment of the human and institutional capacity in place in the case study sites
Due date of deliverable	M28
Lead beneficiary for this deliverable	FAO

	NAME	ORGANIZATION
AUTHOR(S)	Maria Michela Morese	FAO
	Marco Colangeli	FAO
	Lorenzo Traverso	FAO

CONTRIBUTOR(S)

Guido Bonati (CREA), Giuseppe Pulighe (CREA).

DISSEMINATION LEVEL

x Public

DOCUMENT HISTORY

VERSION	DATE	NOTE	ISSUED BY
1.0	30/04/2018	Final	Maria Michela Morese (FAO)
			Marco Colangeli (FAO)
			Lorenzo Traverso (FAO)



This deliverable reflects only the author's view and the Innovation and Networks Executive Agency and the Commission are not responsible for any use that may be made of the information it contains



Contents

1. Introduction	5
2. The Capacity Assessment process	7
2.1. FAO's Capacity Development Framework	8
3. Capacity Assessment Rationale and Tools.....	9
4. The Assessment in the Case Study Countries	15
4.1. Italy	17
4.2. Germany	20
4.3. Ukraine	22
5. Conclusions	24



Figures

Figure. 1 Capacity building event in Kiev, Ukraine (Feb 2018)	6
Figure. 2 Steps in the Capacity Assessment process	7
Figure. 3 FAO's Vision on Capacity Development: A country reaches its development goals only by strengthening its individuals and organizations while creating an enabling policy environment	8
Figure. 4 Mapping of Stakeholders as per FAO's Vision	9



1. Introduction

A capacity assessment (CA) aims to provide a clear picture of a country or sector's capacity in terms of strengths, weaknesses and available assets. It is a structured approach for analysing capacity across three dimensions: individuals, organizations and the enabling environment. Capacity is defined as the set of skills, knowledge and experience of an individual or a group. In the case of FORBIO the assessment of the capacity is meant to inform on the requirements for enhancing knowledge, skills and experience of individuals and institutions to reach the level necessary to enable setting up sustainable advanced biofuels value chains in the target countries. This task encloses a number of challenges in every such investigation, and in the case of novel and hypothetical complex value chains in areas with defined marginal characteristics (i.e. the underutilized lands) these challenges are if possible even greater. This assessment follows the guidelines prepared by, and is based on the vast experience that the Food and Agriculture Organization of the United Nations has gained through its 70+ years of experience in a range of different developing and developed countries.

"In the case of FORBIO the assessment of the capacity is meant to inform on the requirements for enhancing knowledge, skills and experience of individuals and institutions to reach the level necessary to enable setting up sustainable advanced biofuels value chains in the target countries."

CAs identify capacity gaps, and highlight the institutional dynamics, that cause a development challenge to persist. Put another way, even the most well-designed programmes cannot be effective, or sustainable, in situations where capacity gaps hinder delivery. During CAs, stakeholders pool together their first-hand knowledge of a problem and identify solutions that are context-specific (Figure 1). Indeed, the risk of not doing a CA is that underlying causes of a problem and capacity gaps might be overlooked. Results of a CA include:

- Promoting inclusiveness: Stakeholders play key roles in collecting and analysing information and designing interventions. Being fully involved in the entire process leads to ownership of outputs and outcomes.
- Harnessing local knowledge: Local knowledge is critical for understanding the complex systems and dynamics behind the current challenge. It is also essential for identifying appropriate solutions.
- Bringing champions on board: Many participants in the CA process go on to play key roles in moving the capacity development process forward.



During the FORBIO project, the bullets above have all been verified through the work of the partners and the discussions held in each of the case study countries. The mutual benefits of this process have been recognized by the various actors since on the one hand stakeholders have comprehended the multifold implications of bioenergy projects on the areas chosen for the case studies, and on the other hand have offered a great deal of knowledge to FORBIO partners that would have otherwise remained untapped.



Figure 1. Capacity building event in Kiev, Ukraine (Feb 2018).

2. The Capacity Assessment process

Capacity development is a core function of most technical support-based projects because it is intended to provide beneficiaries with skills they lack in order to successfully implement their plans and aspirations, and meet their goals. It is a key to sustainable results at country level and ensures that project's efforts lead to lasting changes. The European Commission places strong emphasis on enhancing delivery in this area as endorsed by the High Level Meeting on Aid Effectiveness in Busan¹. In FAO's view, capacity development is driven by country actors, consistent with national priorities and the local context, and anchored in national systems and local expertise (FAO, 2018²). Capacity development needs to be undertaken in partnership with national, regional and international players and requires long-term interventions rather than stand-alone, short-term events. In addition to the technical assessments which are normally part of programme design, CAs should also be conducted. Findings from CAs should then be the basis for strategic action plans, programmes and projects.



Figure 2. Steps in the Capacity Assessment process³ A country reaches its development goals only by strengthening its individuals and organizations while creating an enabling policy environment.

1. ¹ <http://www.oecd.org/dac/effectiveness/fourthhighlevelforumonaideeffectiveness.htm>

2. ² <http://www.fao.org/capacity-development/our-vision/en/>

3. ³ <http://www.fao.org/capacity-development/resources/practical-tools/capacity-assessment/en/>

2.1. FAO's Capacity Development Framework

A country reaches its development goals only by strengthening its individuals and organizations while creating an enabling policy environment.

Capacities at the three dimensions are interlinked: individuals, organizations and the enabling environment are parts of a whole. Capacity development often involves enhancing the knowledge and skills of individuals, whose work results greatly rely on the performance of the organizations in which they work. The effectiveness of organizations is influenced by the enabling environment. Conversely, the environment is affected by organizations and the relationships between them.

In addition to a three dimensional approach, successful FAO programmes have demonstrated that both technical and functional capacities are crucial for strengthening Member Countries' capacities in agriculture and rural development. Technical capacities are necessary for Member Countries to achieve their development goals in the broad areas of food security, nutrition, agriculture and rural development. Functional capacities enable countries to lead and manage their change initiatives. Enabling capacity of a restricted group of individuals may seem to have a limited impact on the advancements of complex sectors like modern bioenergy, however, the composition of such group of individuals, and the institutions they belong to may in reality ignite transformational changes. This is the case of the intended target groups involved in the FORBIO project, where farmers, land owners and agricultural entrepreneurs are inevitably involved, and in addition relevant attention is paid to assess the needs to enhancing the capacity of institutions that regulate and contribute to agricultural and bioenergy developments in the case study countries.



Figure 3. FAO's Vision on Capacity Development: A country reaches its development goals only by strengthening its individuals and organizations while creating an enabling policy environment.

3. Capacity Assessment: rationale and tools

The rationale behind any CA is that the selection of actors, the procedure to assess their capacity and the subsequent report on capacity needs, looks unequivocally to set the way for the most successful capacity development campaign. Participants in a learning initiative must have the right profile and motivation to ensure that the initiative will be successful. Experience has shown that, when participants do not have the appropriate profile in terms of authority levels and prior experience, the learning is not implemented and neither is it transferred to the organization. In other words, the return on investment of the learning initiative is minimal. Therefore the main point of the capacity development initiative is to provide the audience with skills and knowledge that were not available to them prior to the project and that these are effectively A) acquired; and B) implemented.

According to the capacity development strategy guidelines set forth by FAO, the necessary first step to perform a CA is the selection of the team that will do the assessment and decide how the assessment will be carried out (surveys, desk reviews, focus groups, etc.). In FORBIO this was done already at project inception stage, when the roles and responsibilities of the various project partners have been defined and the actions in the case study countries have been discussed. The second step in the CA process is therefore the selection of stakeholders involved in the assessment. Given the three dimensions of the framework (enabling environment = national policymaker; Organizations = local authorities; Individuals = farmers, investors, land owners, national as well as local authorities' staff) representatives of stakeholder groups have to be involved on the basis of their role in the value chain studied. In order to perform this selection, the stakeholder analysis tool is used to identify key stakeholders. The tool is a compendium of guidelines to support the strategic targeting of the audience.

		OPPOSITION		NEUTRAL	SUPPORT	
		ACTIVE OPPONENT	PASSIVE OPPONENT		PASSIVE SUPPORTER	ACTIVE SUPPORTER
STAKEHOLDER POWER	HIGH					
	MEDIUM					
	LOW					

Figure 4. Mapping of Stakeholders as per FAO's Vision. FAO, 2018, adapted from changingmind.org.

Through its Capacity Development Unit, FAO provides suggestions on how to carry out successful CA and consequent Capacity Development campaign. These guidelines include:

Keep higher-level people (e.g. senior management, team leaders, key community groups) **well-informed and on board**. Not keeping these people in the loop can seriously hamper the effectiveness of the learning and the ability/willingness of learners to transfer their new expertise to members of the organization or the wider group.

High level stakeholders were invited to attend (and present) in FORBIO events. In the first meeting and capacity building event in Carbonia, Italy (October 2016), the Director of the Piano Sulcis, the responsible person appointed by the National Government to manage the development of the area, was invited and attended the meeting and gave a presentation on the perspective of National Initiative on the possible outcomes of the FORBIO project.

Prepare detailed admissions questionnaires. They will help identify potentially unsuitable candidates by asking possible participants to describe their work and the challenges they believe the course will help them address. This can also be used as part of a learning needs assessment.

Questionnaires have been prepared by FAO and shared with the other partners, specifically in the case study and outreach countries. These questionnaires served also as a mean to gain relevant information on the perceived sustainability barriers to the uptake of the value chains studied in the project.

Undertake follow-up interviews (by phone or Skype) with identified candidates to help reconfirm the preliminary choice made on the basis of applications. This is especially helpful for long and resource-intensive initiatives. It also serves as an opportunity to explain unclear aspects of the learning initiative, such as the required time commitment.

As of the time we are writing this report, follow-up interviews have been performed in Italy and Ukraine, with the same key actors selected and involved in the previous meetings to gain their updated perspective and share information on the latest development of the project and their activities on the ground.



Select participants well in advance of the capacity development course, when possible. In this way it may be possible to ask appointing officials for replacement options where advisable. In all cases, the selection process should be as transparent as possible to avoid raising false expectations or claimed injustices.

As mentioned, the engagement of the stakeholders started already in summer 2016 and it has offered continuity to the development of the capacity building courses which will involve the same participants that are familiar with the FORBIO project.

With longer-term learning initiatives involving a series of courses, use a preliminary online course to screen potentially unsuitable candidates.

In FORBIO, webinars have been planned and material is being prepared to complement the learning initiative under WP5.

The FORBIO approach then, followed closely the guidelines of the capacity development strategy of FAO. The tools used for the scoping of the CA were applied since these are fundamental to clarify what and whose capacities need to be investigated and eventually strengthened. The tool includes the creation of a questionnaire to support the description of the sector and the role of each stakeholder. The capacity assessment questionnaire was customized for different stakeholders (farmers, government staff, etc.) as well as the specific sector or challenge, even though in the meetings and events carried out, the questions were put at the audience irrespectively of their association/membership.

The questionnaire was created following, once again, the guidelines set by the Capacity Development Approach of FAO on the differentiated questions for each dimension of the issue:

Dimension: Enabling environment

1. What policies and national strategies exist? Do these policies and strategies define national objectives and priorities adequately for the development of bioenergy projects on underutilized and marginal lands?
2. Is the country a signatory to major international declarations, initiatives and codes? (this is important for the case of Ukraine which, even though not included in the EU has a strong tendency to align to EU policies, as it was specified during the consultations)
3. To what extent are such political commitments (at the international level) actively implemented?
4. In the existing policies, what are the performance improvements that are needed?
5. What are the known capacity weaknesses at the policy level?
6. Are there national sources of funding to support this area of work?

Dimension: Organizations (i.e. formal, informal, public and private, including CBOs and CSOs)

7. Which Ministries and institutions work on this issue? Which Ministries/departments (central and local level) are involved in the development, administration, implementation and enforcement of legislation and regulations?
8. Do the different Ministries/departments and institutions involved in the sector have adequate technical capacity? Are the technical capacities of civil society organizations (CSOs) and the private sector adequate?
9. What are the strengths and weaknesses at the institutional level?
10. Is institutional knowledge at a sufficient level? Is there adequate practical experience in the sector?
11. Is institutional knowledge up-to-date with the latest approaches in this area?
12. Does the relevant Ministry/department have a training programme to improve staff skills at various levels?
13. Over the last 12 months, to what extent have Ministries /departments and other institutions (NGOs and CSOs) experienced turnover of competent staff? Which factors contributed to the turnover (e.g. recruitment, promotion, staffing, supervision, personnel evaluation, salary structures)?



14. Are there mechanisms for ensuring coordination, information exchange and effective policy implementation? What are the strengths and weaknesses of such mechanisms?

Dimension: Individuals

15. What skills are needed to develop an advanced biofuels value chain? What skills are commonly found in this sector?

16. Are there clear requirements for skill levels for individuals?

17. Are there learning opportunities to prepare individuals to respond to country needs at a technical level?

18. Is there adequate practical experience in the sector?

19. Are individuals up-to-date with the latest approaches in the sector?

20. Are individuals familiar with relevant equipment?

The results of the questionnaire and the discussions with the stakeholders on the aspects raised by this interactive exercise will constitute the central pillar of the capacity development campaign.

For this action, the approach suggests using another key tool, the Capacity-focused Problem Tree (CfPT). The results of the questionnaire and the CfPT will allow the preparation of the capacity development campaign.

The CfPT is a tool that identifies a capacity issue as a core problem, as well as its effects and root causes. This method helps initiate and follow up on the collaborative design and implementation phase. It is an interesting tool that helps clarify the precise capacity-development objectives that the intervention aims to achieve. It is helpful to develop and/or revise a log frame and reach clarity about the outputs that will be monitored.

The tool is composed of six steps:

Step 1: Start by brainstorming about all major capacity problems identified during the context analysis, which in the case of the FORBIO project coincides with the background research carried out under task 4.2 on the barriers to the uptake of advanced biofuels in the target countries.

Step 2: Draw a “tree” and write the key capacity problem on the trunk. If there is more than one key capacity problem, one tree per problem will be drawn.



Step 3: Encourage the stakeholders to brainstorm on the causes of the key capacity problem and take note of the outcomes of this exercise in order to prioritize the causes. This was done during the multi-stakeholder meetings in the target countries via updated power point presentation where the feedback and annotations of the stakeholders were promptly reported and projected on screen.

Step 4: Discuss the capacity factors that are possibly contributing to the causes. Focus on the factors that are potential drivers of change and write them on the roots of the tree.

Step 5: Look at the effects/impacts of the capacity problem and write down the primary effects on the branches of the tree.

Step 6: The diagram generated in this exercise provides a basis for discussion and can be converted into a capacity objectives tree, turning the negative statements into positive ones.



4. Assessment in the Case Study Countries

The assessment of the capacity of individuals as well as of institutions in the three case studies derives from the theory described in the previous chapters. The main problem tree established is directly and inevitably linked to the primary goal of the FORBIO project: to enhance the market uptake of bioenergy in the case study area. The result of the brainstorming session held at the beginning of the FORBIO project - Step 1 - is thus quite straightforward in the sense that the aim of the capacity assessment is to get a glimpse of the current preparedness of stakeholders in the three case study countries to embark on the constitution of an advanced bioenergy value chain. The understanding of the implications of such value chains constitute a major component of the assessment. Therefore, the process required that the FORBIO team presented the framework within which the project takes place.

The discussions with stakeholders were framed in the context of possible future establishment of given advanced bioenergy value chains. Such value chains are hypothetical and the FORBIO project is researching actions and ways to encourage their adoption. Therefore, stakeholders were presented with the scenarios in which the underutilized lands in the case study areas are used to produce bioenergy feedstock and bioenergy value chains are established. In order to frame the situation clearly it was necessary to learn about the boundaries of the knowledge of local actors and therefore the questions debated during Step 1 included the following:

Do individuals understand the scenario(s) presented?

Do individuals understand/have experience with bioenergy value chains?

Answers to these questions were not as obvious and understood as one would have imagined, and varying responses were obtained in the different case study countries.

Step 2 consisted in the preparation of Capacity-focused Problem Trees (CfPTs). The initial drive for the definition of the problem trees was the outcome of the background research on the main barriers to the uptake of these value chains that had been deemed strictly related to capacity problems, or that could have been overcome via capacity development.

This was mainly the case of aspects such as the tenure of land in Ukraine, or the acceptance of novel feedstocks in Italy, or the requirement for financial and administrative support in Germany. A common issue that has been included in a dedicated CfPT was considered the scepticism across stakeholders in Italy and Germany towards bioenergy value chains and on to a lesser extent in Ukraine, where the stakeholder working group seemed more prone to engage and contribute to the establishment of emerging markets.



In light of the considerations after the proposition of the various CfPTs in each of the case study countries, Step 3 consisted in an extended list of aspects that required a discussion of root causes. Sometimes one CfPT only stemmed from a single cause, in other cases the contingency of several aspects participated to the materialization of a problem as it was identified in its dedicated CfPT. Through this exercise, it was possible to understand the principal capacity gaps present in the audience during the stakeholder consultations in each of the case study countries.

A common misunderstanding that is often recorded when facing barriers to the uptake of advanced bioenergy value chains consists in the fact that limitations of one's own capacity to tackle an issue are overlooked as inefficiencies of the system. For instance, individuals who have capacity gaps to tackle specific tasks, such as a farmer who is not capable of putting together the necessary documentation to make a project bankable, tend to believe that the system is too complex and blame their incapability to aspects of the systems (such as bureaucracy) whereas perhaps by these individuals with the necessary education to undertake the paperwork required, they might be able to obtain loans or other forms of financing. The solution to this then is clearly the development of human capacity. On the other hand, in other instances those inefficiencies are indeed the result of lack of institutional capacity (e.g. strenuous bureaucracy, etc.) and therefore the most efficient solution would be the enhancement of the capacity of local as well as national institutions to streamline procedures and regulations. The unequivocal verdict on the nature of such inefficiencies can only be obtained through a transparent and professional discussion of capacity factors that are possibly contributing to the causes of the problem, as it was done following Step 4 of the approach to CA.

The impacts and effects of the CfPT have been recorded for each of the case study cases and the primary effects have composed the branches of the tree, as part of Step 5 of the approach. These are being used to produce the capacity development tree that provides a basis for discussion on the needs for discussion and thus it embodies the CA.



4.1 Italy

The Italian Site of National Interest of Sulcis is the largest in Italy, with an overall surface of 22,000 hectares. These are partially inscribed within the former coastal industrial area of Portovesme and partially inscribed by about 10,000 ha of former mining sites inland. In this area agricultural activities are limited by special restrictions imposed by a local directive. The economy of the area, already strongly disadvantaged, is furtherly damaged by the inability to resort to traditional agriculture for the livelihood of the local population. The possibility to use contaminated land for the production of non-food feedstock, and thus its use in the context of advanced biofuels value chains, is an option deeply investigated in Deliverable D 2.1. The first aspect of interest in the assessment of the capacity of individuals and institutions to carry out their respective tasks in a scenario which foresees the development of advanced biofuels value chains from underutilized lands is the scepticism of most stakeholders towards the real potential and business case represented by these agro-industries. The related problem tree identified in the Italian case study is therefore linked to the need to provide adequate information at the various levels around the existence of A) an advanced bioenergy sector in Europe; and B) its direct implications for local stakeholders in Sardinia.

Lignocellulosic ethanol is a scarcely known technology, scarcely present in the common fora of discussion, and scarcely supported by outsider of the advanced bioenergy sector. During our interviews with stakeholders, from farmers to policy makers, the understanding of the topic being discussed varied. Bioenergy and in particular advanced biofuels are complex topics that require a certain level of technical expertise to be fully comprehended. The novelty of certain concepts then, adds up to the difficulty to divulgate its concepts consistently and therefore this component of the bioeconomy is rarely discussed in public fora and broadcasted via mainstream media, whereas it is much debated in the dedicated but rather isolated Commissions in Brussels. The aforementioned aspects may explain why stakeholders, with the sole exception of the academia and research institutes, are not fully aware of the potential of the industry and tend to be particularly sceptical about its potential. In some cases then, even academics interviewed and consulted in the course of FORBIO activities in Italy, although informed of the situation, have moved critics and were sceptical about the potentialities of these value chains.

Advocacy of these technologies to date has been solely carried out by providers of this technologies (e.g. large private companies) with obvious unbalances in the perception of the whole picture from the various stakeholders.

As a possible solution to this first problem, the capacity building campaign should clearly **inform** stakeholders about what is the state-of-the-art concerning advanced biofuels from a policy and scientific point of view. In the context of FORBIO, info days and workshops will represent the perfect opportunity to accomplish this preliminary capacity development task. Current enforced policies, possible uncertainties and other limiting factors should be explained attentively. Partially, the responsibility for the lack



of common understanding and knowledge about advanced bioenergy lays with the media. Several interviewed stakeholders could only recall negative-type of media campaigns linked to bioenergy in general and none linked to specifically advanced bioenergy solutions. In comparison, electric mobility campaigns were very well known by stakeholders at any level, from farmers to researchers and policymakers. The presence in the media of information campaigns has clearly played a relevant role in the public opinion's acceptance of these alternative technologies.

A second need for information is on the actual policy landscape which regulates the production and use of advanced biofuels in Europe. Often, stakeholders are not well aware of the different roles and responsibilities in this kind of agro-industry and tend to be disoriented and inevitably lose interest. In general, when a problem is not understood clearly, not only its solution is pushed forward, but often such problem is avoided altogether and solutions are not faced due to lack of understanding.

It will therefore be a fundamental step in the capacity development campaign of FORBIO in Italy to respond to the needs mentioned above.

The CA in Sardinia also highlighted the lower-than-ideal involvement and competence of local administrators to **support with policy actions** the development path of advanced bioenergy value chains. Regional authorities, including the "Regione Sardegna" and the "Piano Sulcis" administrators, the latter represented in Project Meetings by the Director of the Development Plan, may require support to develop their policymaking capacity in the context of already existing instruments to support the development of agricultural value chains in the area. For instance, to date dedicated energy crops do not qualify for a number of incentives (e.g. RDP, CAP, etc.) that would greatly support their sustainable development in the Sulcis region.

Another relevant Capacity Development (CD) need then concerns the creation of the policy conditions, also often referred to as the *enabling environment* that can support the development of these value chains.

On the side of purely technical skills that could be potentiated through CD activities, in the case of perennial grasses, a further problem tree was raised around the difficulties in eradicating the energy crop (giant reed) once the production cycle is finished. The technique requires the combined use of agro-chemicals and mechanical means, repeating applications and tillage operations. Demonstrations of this technique and detailed instructions on how to perform this task would greatly help farmers in being reassured, and thus less adverse, about these value chains.

Lastly, in the Sardinia case study the contaminated character of the lands studied was ascertained by the local Environmental Protection Agency (ARPA Sardegna) and in the case of the Municipality of Portoscuso, by a third-party research center (email communication, 2017). The process of information collection around this pivotal point resulted particularly cumbersome. Eventually, the FORBIO project team was able to obtain raw data from ARPA Sardegna, but extensive discussions with a number of stakeholders highlighted that ambiguity in the interpretation of the information on



contamination still exists. As the goal of this assessment is to present the areas that require further capacity development, even though this cannot be provided within the context of the FORBIO project, it is worthy to mention that the assessment, reporting and monitoring capabilities of local institutions presents room for enhancement.



4.2 Germany

The German case study is subdivided into two sub-cases. The sewage fields located in the outskirts of Berlin and the former mining sites in the Lusatia region. Meetings with stakeholders belonging to the first sub-case study (i.e. sewage irrigation fields) have not been included in the multistakeholder discussions held up until the time of writing of this report, therefore, the CA in the case of Germany focuses on the lessons learned and the CfPTs discusses with stakeholders in the former mining sites. However, likely most of the inputs from this exercise will be applicable to the case of the former sewage irrigation fields.

For a number of reasons discussed elsewhere in the deliverables of the FORBIO project, it was chosen to focus on traditional biomass production for bioenergy in the German case studies, and in some cases the bioenergy pathway studied is biomethane from food-feedstocks.

The proposed use of traditional feedstock types (e.g. grass, sorghum, Lucerne) in Germany frees farmers from the burden of engaging with novel or unknown dedicated energy crops with which they do not have experience and therefore may require specific capacity enhancements concerning cultivation techniques. On the other hand, the characteristics of the proposed value chains, and thus the segregation character of the chain and its products, poses similar issues to those observed in the case of Italy. The biomass in fact, may carry pollutants and contaminants that, if not thoroughly segregated from other biomass streams (e.g. feed) may contaminate material not destined to be processed into bioenergy or worse be exchanged and mixed on the feed market with the consequent risk that such material is ingested by livestock and indirectly pass on to humans consuming meat and other products derived from the livestock in question. In order to avoid this possibility, a capacity development campaign needs to be put in place. This campaign would be geared primarily at the actors that are responsible for ensuring compliance with pollution confinement laws, thus mainly public-sector environmental protection agents and senior management, but also farmers must be informed and receive authorization to operate with such products. Environmental Protection Agencies' senior management should be informed about the necessity to dedicate resources to supervising the handling of biomass produced in the case study sites. Environmental Protection Agencies' agents should receive direct training on the principles of segregation and chain of custody, along the lines with what is enforced by auditors of recognized certification schemes.

As emerged during various exchanges and multi-stakeholder discussions, another fundamental aspect where the capacity of a number of actors along the value chain will require support concerns the financial implications and the planning of investments for the bioenergy sector. In fact, technical support to project development will need to include considerable efforts to equip stakeholders with the necessary knowledge required to fulfil project financing applications. Making a bioenergy project bankable in areas characterized by a depressed economy will not be an easy task for stakeholders, especially for farmers who will certainly benefit from external support



and training on how to plan and file an application for funds. The support to the organization of committees and Producer Organizations may be of help in this endeavour.

Consistently, financial preparedness of stakeholders emerged as the main topic that required further development. However, not only the capacity of beneficiaries requires support in Germany, but the policy barriers represented by the lack of adequate instruments such as incentives (e.g. tax breaks, tariffs, etc.) would also benefit from an open discussion on this topic. Lastly, the sharing of successful experiences from other areas in Europe and the further development of the capacity of local and national policymakers would enable stakeholders in Germany to contribute to the market uptake of bioenergy from the underutilized lands in the case study areas.



4.3 Ukraine

In Ukraine, an area of underutilized agricultural land in the Ivankiev Region covers approximately 16,200 ha. In the region private companies have tested with success willow Short Rotation Coppice management of a 50 ha parcel with promising results summarized in Deliverable D 2.5 and 2.6. However, among the main capacity needs, during the course of the FORBIO project it emerged that the requirements for well adapted seedlings and the specific agricultural practices adopted, especially during the early stages of development of the plantation, require attentive care and enhancement of the existing capacity. Farmers in this area of Ukraine in fact, have limited experience with willow with the exception of large agri-holdings which instead are specialized in this type of farming⁴. The selection of hybrids, the fertilization and weeding management regime adopted and the other tillage operations especially in the first years after implant require well-trained personnel at all levels of the production value chain.

As in the case of the Italian case study, the second-generation ethanol pathway hypothesized in the context of Ukraine will require an accurate capacity development work to contribute to familiarizing farmers with this novel market and value chain. The actors of the lignocellulosic ethanol sector are unknown to local farmers and associations of producers and an important aspect for the development of the sector is the provision of information and training about the structure of the sector, who are the players, what are the implications and the benefits of this business. Conversely to what studied in Italy however, the feedstock selected for the simulations in the context of FORBIO in Ukraine (willow), is not perceived as a threat and regarded with as much scepticism as the use of giant reed in Italy, but the use of woodchips for the production of ethanol is an equally uncommon practice and thus actors along the value chain may require further information and experience in order to feel comfortable with investing time and resources in planning the development of this sector. Enabling these value chains in Ukraine would require that mechanisms of connection between the producers and the buyers of biomass and biofuels are established.

The most peculiar capacity development need in the case study area in Ukraine emerged in two consecutive multi-stakeholder discussions. The complex land tenure structure and the outdated land tenure register and classification of the country often makes it difficult to navigate the bureaucratic labyrinth that leads to a clear identification of the property rights linked to a given parcel of land. Often times this structure is complex to a point where farmers, agricultural entrepreneurs and land owners find it too difficult to ascertain the property of a given land allotment. This aspect opens up a serious need for further capacity development on both ends: users (e.g. farmers) as well as institutions (e.g. local and central government land registries). Capacity of end users, aspiring to become land owners or leasers, should be improved by means of training carried out together with the technical staff of land registries at

⁴ In Ukraine, private agricultural holdings have actually developed specific capacity (i.e. techniques and tools) that could be helpful for other farmers in the area through a form of transfer from farmer to farmer.

the Oblast level. In addition, it is important that managing staff of these registries are informed about the difficulties of users and the limitations to development of agriculture that these difficulties cause. They should also be informed about the need for reforms of the system and transmit such request to the decision makers to act towards the production of a more straightforward procedure of classifying land ownership and acquisition procedures. This is a fully institutional type of capacity building activity that is expected to deliver unprecedented benefits to the development of the bioenergy sector in Ukraine.



5. Conclusions

The needs for capacity development of stakeholders at individual, organization as well as at enabling environment level, have been assessed for each of the case study countries (Italy, Germany and Ukraine). The assessment has stemmed from the FAO approach to Capacity Development and it has been ran through a series of desk reviews, problem identifications, multi-stakeholder consultations, brainstorming sessions and finally compiled into this report.

It should be noted that the results of the Capacity Assessment highlight capacity aspects that require further development in order to foster the market uptake of bioenergy in the case study areas, however it is not implied that 100 percent of these needs can be effectively met within the context of the capacity development work carried out in FORBIO. In fact, specific aspects emerged to require long-term and large-scale type of capacity development support which might not be delivered within the extent of the FORBIO project.

Some cross-cutting capacity needs are shared among the three case study sites, whereas others are strictly linked to specific crop, or to the economy of a certain region, or even to the institutional framework and cultural heritage of an area, and are therefore unique to such case study.

Summarizing the aspects that require further development we can make the following list:

Italy:

- 1) Scepticism of most stakeholders towards the real potential and business case represented by advanced bioenergy agro-industries;
- 2) Lack of understanding of/keeping up with the mutating policy landscape which regulates the production and use of advanced biofuels in Europe;
- 3) Lower-than-ideal involvement and competence of local administrators to support with policy actions the development path of advanced bioenergy value chains;
- 4) In the case of perennial grasses, the difficulties in eradicating the energy crop once the production cycle is finished requires specific training on sustainable eradication techniques;
- 5) Ambiguity in the interpretation of the information on contamination still exists, thus the capacity of local authorities and agencies to assess, report, monitor and above all communicate effectively the results of their work may be enhanced further.

Germany:

- 1) Establishment of a chain of custody for the biomass produced on contaminated sites is necessary and capacity to develop such system (unknown in traditional agriculture) should be enhanced;
- 2) Financial implications and the planning of investments for the bioenergy sector require support;
- 3) Lack of adequate instruments such as incentives (e.g. tax breaks, tariffs, etc.) would also benefit from an open discussion on this topic.

Ukraine:

- 1) Independent farmers have little or no experience with willows and other dedicated energy crops, whereas large agri-holdings have capacity and equipment
- 2) Knowledge about the potential of advanced biofuel value chains is scarce and information should be provided and capacity to engage in this sector enhanced;
- 3) Loose connection between biomass producers, biomass traders and biofuel producers are present and need to be strengthened;
- 4) Complex land tenure structure and the outdated land tenure register and classification of the country makes it difficult to navigate the bureaucratic labyrinth that leads to a clear identification of the property rights linked to a given parcel of land.

The summary of capacity development needs is non-exhaustive and it should be considered as a first assessment. It is likely that aspects of the value chain that were stated as fully-known and familiar during the multi-stakeholder consultations may have been over- or under-estimated. In case a hypothetical project to develop a supply chain along the lines with those proposed in the several FORBIO scenarios materializes, further capacity needs will emerge. These can hardly be guessed at this stage while it is clear that the capacity needs listed in this report will cover some of the main lacks of farmers, biomass traders, local institutions, local and central scientific agencies and research centers, as well as some inefficiencies of EU policies and their mainstreaming.

To the extent possible, FORBIO will work on the capacity needs above to provide stakeholders with means to overcome the barriers placed by the lack of capacity. These activities (report due on month 32) will support stakeholders' readiness to set up sustainable bioenergy supply chains on contaminated and underutilized lands.

